UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

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OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

MEMORANDUM

SUBJECT: Revised Proportion of Imported Oranges, Orange Juice, Potatoes, and Sweet Potatoes as a Component of Total Consumption in the United States and Review of Registrant submitted Percent Crop Treated Estimate for Sweet Potatoes: Data to Support the Human Dietary Risk Assessment of Aldicarb (PC Code 098301)

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THRU: Diann Sims, Chief
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TO: Sue Bartow, Chemical Review Manager
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Pesticide Re-Evaluation Division (7508P)

William Donovan, Chemist
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BEAD has revised the aldicarb assessment based on input from Mexico and Costa Rico. Costa Rica confirmed that aldicarb use has been banned in that country. In contrast, Mexico indicated that aldicarb is registered as a granular application for both citrus and potatoes. As such, the original document was only changed to remove Costa Rica aldicarb use in estimating percent of import dietary consumption for orange juice. The document now indicates that aldicarb acute and chronic dietary estimates for import consumption are 20% and 17%, respectively. All other estimates have remained the same as presented in the original document.

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PRP Date: September 28, 2016

This memorandum transmits the percent of imported commodity in domestic consumption for oranges, orange juice, and potatoes to support the dietary risk assessment for aldicarb which is currently undergoing registration review (Table 1). Data was adjusted to reflect only major exporter countries in which there is no indication of aldicarb ban. In the absence of a verifiable ban on aldicarb, rather than simply not registered, it is assumed that aldicarb could still be applied. Therefore, use of the percent of imports from these countries provides reasonable certainty that the estimated proportion of commodity treated will not be exceeded. BEAD also provides a review of the registrant submitted Percent Crop Treated (PCT) value for the use of aldicarb on sweet potatoes as a suitable estimate for domestic use. These data are provided in support of the dietary risk assessment for aldicarb.

Data from the Economic Research Service (ERS) and Foreign Agricultural Service (FAS) of the United States Department of Agriculture (USDA) were used to derive the percent of imported oranges, orange juice, potatoes, and sweet potatoes in domestic consumption. Percent imports as presented in this memo are defined as the quantity of imports relative to the total commodity availability, i.e., the amount of imports for the commodity (in million lbs or gal) divided by the total amount available for consumption in the US accounting for both production and exports. The average proportion of imports is calculated as the simple average of the annual percentages and is representative of the chronic PCT. The highest import consumption represents the acute PCT.

Table 1. Summary of Aldicarb Component of Selected Imported Commodities in Total U.S. Dietary Consumption.

Commodity	Recommended PCT Values	
	Average (chronic)	Maximum (acute)
Oranges	2%	3%
Orange Juice	17%	20%
Potatoes		
Fresh	0%	0%
Freezing	0%	0%
Processed	3%	4%
Sweet Potatoes	31%	34%

Oranges

The major exporters of oranges to the United States are Chile, Mexico, South Africa, and Australia (Table 2). These four countries account for 96% of U.S. orange imports. Aldicarb use has been banned in Chile, South Africa, and Australia. BEAD has verified aldicarb use in Mexico (Tovar Díaz, A. L., 2017) and as such this usage is considered in relation to domestic consumption of imported oranges in this assessment (Table 3).

Table 2. U.S. Importation of Oranges in Million Lbs from 2012-2014

	2012	2013	2014	Yearly Average
Partner	**Qty**	**Qty**	**Qty**	**Qty**
Chile	113.6	129.8	107.0	116.87
Mexico	38.4	61.6	99.7	66.5
South Africa	79.3	79.4	80.0	79.6
Australia(*)	24.5	23.0	15.0	20.8
Grand Total (world)	262.4	307.2	317.5	295.7

(*) denotes a country that is a summarization of its component countries.
Source(s): USDA/FAS 2016

Table 3. Percent Import Share in Consumption for Fresh Oranges.

Year	US Production (Million. Lbs)	Commodity Export (Million Lbs)	Available domestic for Consumption (Million Lbs)	Commodity Imports (Million Lbs)	Total Available for Consumption (Million Lbs)	% Import Component of Consumption	% of Aldicarb treated Orange Imports (Mexico)*	% Imported Oranges from Mexico as Component of Total Consumption
2012	4,558.9	1,531.8	3,027.2	262.6	3,289.8	8%	14.6%	1%
2013	4,474.9	1,495.4	2,979.4	307.3	3,286.7	9%	20.0%	2%
2014	3,790.6	1,120.9	2,669.7	315.4	2,985.1	11%	31.4%	3%

Source(s): USDA/ERS 2016 and *USDA/FAS 2016

On average over the 2012 to 2014 time period, 2% of the fresh oranges with potential aldicarb usage for domestic consumption were imported. This value is appropriate for use in a chronic dietary risk assessment. A maximum of 3% of domestic consumption was imported from Mexico with potential aldicarb usage; this value would be appropriate as a measure of possible acute exposure.

Orange Juice

On average over the 2012 to 2014 time period, 73 percent of the orange juice available for domestic consumption was imported. The three largest exporters of orange juice to the U.S. are Brazil, Mexico, and Costa Rica (Table 4). These countries account for 94% of all U.S. orange juice importation. Brazil and Costa Rica have banned the use of aldicarb so there would be no contribution to aldicarb dietary consumption from this country. However, BEAD was able to determine that aldicarb is used in orange production in Mexico (Tovar Diaz, A. L., 2017) and as such is included in the assessment of domestic consumption of imported orange juice (Table 5). On average over the time period of 2012 to 2014, 17% of the fresh oranges with potential aldicarb usage for domestic consumption were imported. This value is appropriate for use in a chronic dietary risk assessment. A maximum of 20% of domestic consumption was imported; this value would be appropriate as a measure of possible acute exposure.

Table 4. U.S. Importation of Orange Juice in Million Gallons from 2012-2014.

	2012	2013	2014	Yearly Average
	Qty	Qty	Qty	Qty
Brazil	118.9	216.4	296.0	210.4
Mexico	71.8	121.8	119.6	104.4
Costa Rica	29.4	33.7	28.5	30.5
Grand Total (world)	241.4	317.1	387.5	366.7

Source(s): USDA/FAS 2016

Table 5. Percent Import Share in Consumption for Orange Juice.

Year	US Production (Million Gal)	Commodity Export (Million Gal)	Available domestic for Consumption (Million Gal)	Commodity Imports (Million Gal)	Total Available for Consumption (Million. Gal)	% Import Component of Consumption	% of Aldicarb Treated Juice Imports (Mexico)*	% Imported Juice from Mexico as Component of Total Consumption
2012	391.3	148.4	242.9	241.4	484.3	50%	29.8%	15%
2013	448.9	153.7	295.2	317.1	612.3	52%	38.4%	20%
2014	534.2	147.4	386.8	387.5	774.3	50%	30.9%	15%

Source(s): USDA/ERS 2016 and *USDA/FAS 2016

Potatoes (Total)

On average over the 2012 to 2014 time period, 14 percent of the potatoes available for domestic consumption were imported (fresh 8%, frozen 23%, and processed (chips, dehydrated, canned) 8%). Both fresh and frozen potatoes are primarily imported from Canada (Table 6). As Canada has banned the use of aldicarb, there would be no impact of aldicarb on domestic consumption.

Processed non-frozen potatoes (chips, dehydrated, and canned potatoes) are imported from Canada, Mexico, Germany, China, Italy, and the Netherlands. As aldicarb use has been banned by Canada and European Union countries, processed potato imports from these countries would not contribute to the dietary component of aldicarb in domestic consumption. Similarly, China has restricted use of aldicarb for potato production and it also would not contribute to domestic consumption. BEAD has been able to confirm use of aldicarb in Mexico (Tovar Díaz, A. L., 2017). As such, BEAD has included imported processed potatoes from Mexico as a component of domestic consumption (Table 7). Imported processed potatoes (canned, chipped, dehydrated) would contribute 3% to chronic and 4% acute dietary exposure as import component of total consumption.

Table 6. U.S. Importation of Potatoes by Type in Million Lbs 2012-2014.

Potato Product	Country	2012 Qty	2013 Qty	2014 Qty	Yearly Average Qty
Fresh	Canada	619.8	714.9	883.9	739.5
	Total (world)	619.8	714.9	884.1	739.7
Frozen	Canada	1,582.1	1,721.2	1,718.8	1,674.0
	Total (world)	1,653.9	1,755.5	1,736.5	1,716.1
Processed (non-frozen)	Canada	38.3	38.0	41.7	39.3
	Mexico	41.9	38.6	35.8	38.8
	Germany*	14.9	18.4	6.2	13.2
	China	3.0	1.9	3.5	2.8
	Italy	2.4	1.4	1.1	1.6
	Netherlands	4.6	0.1	-	1.6
	Total (world)	106.7	101.1	93.4	102.2

(*) denotes a country that is a summarization of its component countries.
Source(s): USDA/FAS 2016

Table 7. Percent of Potato Import Share in Consumption by Type (2012-14).

Potato Type	US Production (Mil. Lbs)	Commodity Export (Mil. Lbs)	Available domestic for Consumption (Mil. Lbs)	Commodity Imports (Mil. Lbs)	Total Available for Consumption (Mil. Lbs)	% Import Component of Consumption	% of Aldicarb Treated Import Potatoes**	% Import Potato from Mexico as Component of Total Consumption
Fresh (2012-2014) average	10,930.1	988.2	9,941.9	889.3	10,831.2	8%	0%	0%
Frozen (2012-2014) average	15,748.9	4,165.4	11,583.5	3,415.7	14,999.2	23%	0%	0%
Processed* (2012-2014) average	11,105.2	1,840.5	9,264.7	836.3	10,100.9	8%	38%	3%
2012	10,892.4	1,823.0	9,069.4	1,052.8	10,122.2	10%	39%	4%
2013	10,916.5	1,752.0	9,164.5	737.7	9,902.2	7%	38%	3%
2014	11,506.73	1,946.5	9,560.3	718.2	10,278.4	7%	38%	3%

(*) includes canned, chipped, and dehydrated potatoes
** imported potatoes from Mexico for Processed potatoes
Source(s): USDA/ERS 2016 and USDA/FAS 2016

Sweet Potatoes Percent Crop Treated (PCT)

BEAD also reviewed the data submitted by AgLogic Chemical LLC (August 31, 2016). AgLogic indicates that usage on sweet potatoes is restricted to the states of Louisiana and Mississippi. Based on total US sweet potato production (169,000 acres) and sweet potato production in Louisiana and Mississippi (35,000 acres), AgLogic estimated an average PCT of 21% and worst case scenario PCT of 35% (AgLogic, 2016).

BEAD reviewed national sweet potato production for the years 2002, 2007, and 2012 (USDA/NASS, 2007 and 2012) (Table 8) and confirmed the label restriction to use only in Louisiana and Mississippi. According to U.S. Census of Agriculture data, Louisiana and Mississippi sweet potato acreage ranges from 25% to 34% of total U.S. acreage (Table 8). Assuming a worst case scenario in which every sweet potato acre in Louisiana and Mississippi would be treated with aldicarb, BEAD believes a more accurate estimate for domestic dietary risk assessment based on historical sweet potato production would be 31% for chronic exposure and 34% for acute exposure.

The countries with greatest export of sweet potatoes to the U.S. include Dominican Republic, Peru, China, and Canada (Table 9). These 4 countries account for 99.1% of sweet potatoes imported by the United States. Furthermore, all 4 countries have banned the use of aldicarb. There would negligible contribution of imported aldicarb treated sweet potatoes to total consumption of sweet potatoes (Table 10).

Table 8. United States Sweet Potato Harvest for 2002, 2007, and 2012.

Year	National (acres)	Louisiana and Mississippi (acres)	Percent Crop Treated for Louisiana and Mississippi (PCT)*
2002	92,310	30,369	33%
2007	105,284	35,890	34%
2012	125,726	31,486	25%

(*) based on all harvest acres treated
Source(s): USDA/NASS 2007 and 2012

Table 9. U.S. Importation of Sweet Potatoes in Million Lbs from 2012-2014.

	2012	2013	2014	Yearly Average
Partner	Qty	Qty	Qty	Qty
Dominican Republic	14.8	14.3	15.2	14.8
Peru	8.2	9.4	12.9	10.1
China	2.5	9.0	4.5	5.3
Canada	1.2	1.0	2.7	1.6
Grand Total (world)	26.7	33.9	35.6	32.1

(*) denotes a country that is a summarization of its component countries.
Source(s): USDA/FAS 2016

Table 10. Percent Import Share in Consumption for Sweet Potatoes.

Year	US Production (Million. Lbs)	Commodity Export (Million Lbs)	Available domestic for Consumption (Million Lbs)	Commodity Imports (Million Lbs)	Total Available for Consumption (Million Lbs)	% Import Component of Consumption	% of Aldicarb treated Sweet Potato Imports*	% Imported Sweet Potatoes as Component of Total Consumption
2012	2,648.2	246.3	2,401.9	26.8	2,428.7	1%	0%	0%
2013	2,478.5	280.7	2,197.8	34.1	2,231.8	2%	0%	0%
2014	2,958.4	311.1	2,647.3	36.0	2,683.3	1%	0%	0%

Source(s): USDA/ERS 2016 and *USDA/FAS 2016

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